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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,328	02/11/2004	Kiyoshi Kato	0756-7254	8545

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EXAMINER	
FULK, STEVEN J	

ART UNIT	PAPER NUMBER
2891	

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/775,328	KATO ET AL.	
	Examiner	Art Unit	
	Steven J. Fulk	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/18/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed May 18, 2006, which amends claims 1-2 and adds claims 20-21, has been entered. Claims 1-21 are currently pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovshinsky et al. '471 in view of Mueller '625. The process limitations of detaching and stacking the semiconductor elements found in product claims 5-8 invoke the product-by-process doctrine. Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps (*MPEP § 2113*). For example, anticipation of claim 5 does not require that the semiconductor elements be stacked by transferring an element formed over a different substrate.

a. Regarding claims 1, 3, 5, 7, 9, 16-19 and 21, Ovshinsky et al. discloses a semiconductor device (fig. 6A; col. 18, lines 58-66) comprising stacked thin film semiconductor circuits each having a thin film transistor (DIFETs 232, 234), with an adhesive film (leveling film, 220) and an insulating film (236) formed between semiconductor circuits. The reference

discloses a light emitting element and a light receiving element electrically connected to one of the stacked semiconductor elements (col. 6, lines 24-29); a first electric signal from the respective thin film transistor inputted into the light emitting element and converted into an optical signal; and the optical signal converted into a second electric signal in the light receiving element and inputted into the respective thin film transistor (col. 6, lines 5-23); and the light emitting element to comprise a first electrode, a second electrode and an electro-luminescent layer between the electrodes (col. 15, lines 28-29; fig. 6A, electro-luminescent layer 158 between electrodes A2 and K2).

Ovshinsky et al. does not explicitly teach the leveling film that holds together the stacked semiconductor circuits to comprise a resin. Mueller teaches a stacked optoelectronic coupling element wherein a resin (fast-curing adhesive) is used to hold together a light emitting device and a light receiving device (fig. 2, col. 2, line 64 – col. 3, line 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the resin of Mueller as the adhesive leveling film in the device of Ovshinsky et al. One would have been motivated to do this because resin was a well known adhesive used in optoelectronic devices that would have improved the device quality by providing a firm joint between elements and reduced process time by quickly curing (Mueller, col. 2, line 64 – col. 3, line 2).

b. Regarding claims 2, 4, 6, 8, 10 and 16-19, Ovshinsky et al. in view of Mueller discloses all of the elements of the claims as discussed above including an insulating film between the semiconductor elements, but does not explicitly teach the insulating film to be a metal oxide. Mueller teaches a stacked optoelectronic coupling element wherein a metal oxide is formed between the stacked elements (fig. 2, 3; col. 3, lines 15-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the metal oxide of Mueller as the insulating film in the optoelectronic device of Ovshinsky et al. One would have been motivated to do this because metal oxides were well known insulating materials used in optoelectronic devices due to their excellent insulation properties and their transparency (Mueller, col. 3, lines 15-17), which would allow the device to perform its intended function by propagating the optical signal within the device.

c. Regarding claims 11-15, Ovshinsky et al. in view of Mueller discloses all of the elements of the claims as discussed above including using the semiconductor device in a computer or central processing unit (Ovshinsky et al., col. 4, lines 32-38), but does not explicitly teach using the device in a mobile phone, electronic book, electronic card or watch card.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an optoelectronic coupling semiconductor device in a mobile phone, electronic book, electronic card, or watch card. One would have been motivated to do this because all of the

devices listed are well known examples of devices that require a central processing unit and relay switches to operate, and using an optoelectronic switching device instead of an electrical relay would have increased the device performance by providing a smaller size, longer life, higher switching rate and faster response time (Mueller, col. 1, lines 21-25).

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ovshinsky et al. '471 in view of Mueller '625, and further in view of Yuan et al. '206.

Ovshinsky et al. in view of Mueller teaches all of the elements of the claim as set forth in paragraph 3 above, but the references do not teach the light emitting element to be an organic light emitting device. Yuan et al. teaches a semiconductor optocoupler device having stacked elements comprising a light emitting device (fig. 1, 104) and light receiving device (102), wherein the light emitting device is an organic light emitting device (¶32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the organic light emitting device of Yuan et al. in the semiconductor device as taught by Ovshinsky et al. in view of Mueller. One would have been motivated to do this because Yuan et al. taught that organic light emitting devices were capable of being fabricated on any smooth surface at low processing temperatures (¶05), which resulted in less defects formed in the devices and improved their performance (¶02).

Response to Arguments

5. Applicant's arguments filed May 18, 2006, with respect to the rejection of claims 1-19 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.

Applicant argues that Ovshinsky et al. does not teach a light receiving element electrically connected to one of stacked semiconductor elements or stacked thin film integrated circuits. This argument is not persuasive because the claim language is written broadly enough to be anticipated by figure 6A of Ovshinsky et al., which shows a stack of a light emitting DIFET (232) and a light-detecting DIFET (234) (col. 7, lines 24-29), wherein the light receiving element (158') is electrically connect to one of the stacked thin film integrated circuits (DIFET 234).

Applicant also argues that Mueller alone does not teach a light receiving element electrically connected to one of stacked semiconductor elements or stacked thin film integrated circuits. This argument is not persuasive because one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It was the Examiner's position that the combination of Ovshinsky et al. in view of Mueller taught all of the elements of the claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kohashi '056, Thillays '877, Miyoshi et al. '821, Stein '695, Yasumoto et al. '083, Lebby et al. '245, Vu et al. '953, Hayashi et al. '699, Spaeth et al. '559, and Haas et al. '214 disclose stacked optoelectronic coupling devices.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Fulk whose telephone number is (571) 272-8323. The examiner can normally be reached on Monday through Friday, 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven J. Fulk
Patent Examiner
Art Unit 2891

BRADLEY K. SMITH
PRIMARY EXAMINER

July 18, 2006